Reprinted from

THE JOURNAL OF THE ELISHA MITCHELL SCIENTIFIC SOCIETY

Volume 88, Number 4—Winter, 1972

P. 194-195.

• DIEL PERIODICITIES AND DRIFT INDICES OF INSECTS IN THE SNAKE RIVER, GRAND TETON NATIONAL PARK, WYOMING. *Richard L. Kroger.* Insect drift in the Snake River was monitored in 1966 as part of an ecological and classification study of the invertebrates. One-hour collections of drifting insects were continuously made during two 24-hour sampling periods in two riffles. Diel periodicities were recorded and drift indices calculated for 25 taxonomic groups of invertebrates.

In riffle 1 on July 8 and 15, drift of the mayfly *Ephemerella inermis* Eaton, the caddisfly *Hydropsyche* sp., the dipteran *Simulium* sp., and the two stoneflies *Alloperla* sp. and *Isoperla* sp. sharply increased during the first two hours of darkness. Numbers of these insects drifting then steadily declined until sunrise, when the low diel rate was reached. Water mites and chironomids drifted at random during these 24-hour periods.

In riffle 2 on August 26 and 27, two distinct peaks in drift of the alternans type (smaller peak of drift first and larger second) were recorded during the nights for the mayfly *Paraleptophlebia packii* Needham and the caddisflies *Hydropsyche* sp. and *Arctopsyche* sp. Mayflies *Ephemerella grandis ingens* Eaton and *Rithrogena hageni* McDunnough and the stoneflies *Pteronarcella badia* (Hagen), *Isogenus* sp., and *Acroneuria pacifica* Banks also exhibited an alternans drift pattern, but fewer individuals were collected. The mayflies *Baetis bicaudatus* Dobbs and *B. tricaudatus* Dodds showed two distinct peaks of drift of the bigeminus type (larger peak of drift first and smaller second) during the nights. In contrast, the stonefly *Alloperla* sp. and the mayfly *Ephemerella tibialis* McDunnough drifted mainly during daylight. In this riffle chironomids had a distinct peak of drift early in the night and simuliids drifted at random.

Drift indices, which are a measure of a species tendency to drift under the prevailing environmental conditions, were calculated by dividing the total number of each species collected in the 24-hour drift series by the number collected in five Surber 1-ft^2 samples from the riffle. High drift indices of 10 or greater were calculated for the stoneflies *Alloperla* sp., *Isogenus* sp. and *Isoperla* sp.; and the mayflies *E. inermis, E. tibialis, B. tricaudatus* and *P. packii. Glossosoma montana* Ross, a stone-cased caddisfly, was the only abundant insect that had a drift index of zero. Other less numerous insects with indexes of zero were the stonefly *Claassenia sabulosa* (Banks), the caddisflies Limnephilidae, and the dipteran *Metachela* sp. The average drift index in riffle 1 was six times greater than in riffle 2. The higher rate of drift in riffle 1 may have resulted from the low carrying capacity of the substrate or because of the abundance of mature insects.